

## Claims

- [c1] 1.A method of creating an equivalent model for an integrated circuit (IC) and package, the IC including a plurality of input/outputs (I/Os), the method comprising the steps of:
- generating an intermediate model by partitioning the IC into a plurality of simulation windows having a substantially similar characteristic;
- converting I/Os within each simulation window to a current source; and
- generating the equivalent model for at least one simulation window based on an observed current change rate of the simulation window during a simulation.
- [c2] 2.The method of claim 1, wherein the step of generating includes:
- a) simulating operation of the intermediate model and monitoring a current change rate of the at least one simulation window; and
- b) converting the current change rate of each simulation window to respective I/Os based on known I/O current change rates to generate the equivalent model.
- [c3] 3.The method of claim 2, wherein the step of converting to I/Os includes converting to actual I/Os based on known current rate changes of I/Os and maintaining actual ratios of different types of I/Os within each simulation window.
- [c4] 4.The method of claim 1, wherein each current source has substantially the same current change rate as the I/Os.
- [c5] 5.The method of claim 1, wherein the substantially similar characteristic is inductance and capacitance.
- [c6] 6.The method of claim 1, further comprising the step of determining a parasitic characteristic of each simulation window.
- [c7] 7.The method of claim 1, further comprising the step of calculating the observed current change rate based on an observed voltage drop and a known inductance.
- [c8] 8.A computer program product comprising a computer useable medium having

computer readable program code embodied therein for creating a simplified equivalent model for an integrated circuit (IC) and package, the program product comprising:

program code configured to generate an intermediate model by partitioning the IC into a plurality of simulation windows having a substantially similar characteristic;

program code configured to convert an I/O within each simulation window to a current source; and

program code configured to generate the equivalent model for a simulation window based on an observed current change rate of the simulation window during a simulation.

- [c9] 9.The program product of claim 8, wherein the equivalent model generating program code includes:
- a) program code configured to simulate operation of the intermediate model and monitor a current change rate of the at least one simulation window; and
  - b) program code configured to convert the current change rate of each simulation window to I/Os based on known I/O current change rates to generate the equivalent model.
- [c10] 10.The program product of claim 9, wherein the current change rate converting program code converts each current source to actual I/Os based on known current rate changes of I/Os and maintains actual ratios of different types of I/Os within each simulation window.
- [c11] 11.The program product of claim 8, wherein each current source has substantially the same current change rate as the I/Os.
- [c12] 12.The program product of claim 8, wherein the substantially similar characteristic is inductance and capacitance.
- [c13] 13.The program product of claim 8, wherein the intermediate model generating program code includes program code configured to determine a parasitic characteristic of each simulation window.
- [c14] 14.The program product of claim 8, further comprising program code

configured to calculate the observed current change rate based on an observed voltage drop and a known inductance.

- [c15] 15.A computer system for creating an equivalent model for an integrated circuit (IC) and package, the system comprising:  
an intermediate model generator that generates an intermediate model by partitioning the IC into a plurality of simulation windows having a substantially similar characteristic;  
an I/O converter that converts I/Os within each simulation window to a current source; and  
an equivalent model generator that generates the equivalent model for a simulation window based on an observed current change rate of the simulation window during a simulation.
- [c16] 16.The system of claim 15, wherein the equivalent model generator converts each current source to actual I/Os based on known current rate changes of I/Os and maintains actual ratios of different types of I/Os within each simulation window.
- [c17] 17.The system of claim 15, wherein each current source has substantially the same current change rate as the I/Os.
- [c18] 18.The system of claim 15, wherein the substantially similar characteristic is inductance and capacitance.
- [c19] 19.The system of claim 15, wherein the intermediate model generator determines a parasitic characteristic of each simulation window.
- [c20] 20.The system of claim 15, wherein the observed current change rate is based on an observed voltage drop and a known inductance.